



MIDLAND

**water pollution
control plant**

1968

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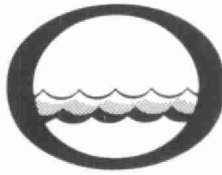
Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario


We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

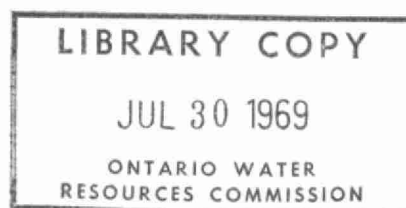
Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.


D. S. Caverly,
General Manager.


D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.



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MIDLAND
water pollution control plant

operated for

THE TOWN OF MIDLAND

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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'68 REVIEW

A total of 497.54 million gallons was treated during the year at a cost of \$28,281.17. This can be expressed as \$56.84 per million gallons.

The average BOD and suspended solids removals were 36 percent and 61 percent respectively. These results were slightly less than the previous year's.

The plant received wastes from industries in the Town. Some of these wastes upset the sewage plant's process on numerous occasions.

The Midland Water Pollution Control Plant was operated efficiently throughout the year by the two operators, with supervision of the plant eight hours per day, seven days a week.

Two pumping stations at Vinden Street and at Wye Valley will be operated by Commission personnel when an operating agreement is made with the Town of Midland.

The takeover is expected to occur by mid-year of 1969.

PROJECT COSTS

| | |
|---|---------------------|
| NET CAPITAL COST (Final) | \$822,029.32 |
| DEDUCT - Portion Financed by CMHC-MDLB (Final) | <u>496,399.44</u> |
| Long Term Debt to OWRC | <u>\$325,629.88</u> |
| Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968 | \$ <u>24,996.33</u> |
| Net Operating | \$ 28,281.17 |
| Debt Retirement | 6,571.00 |
| Reserve | 18,426.01 |
| Interest Charged | <u>28,281.17</u> |
| TOTAL | \$ <u>58,450.08</u> |

RESERVE ACCOUNT

| | |
|------------------------------|---------------------|
| Balance at January 1, 1968 | \$ 16,995.64 |
| Deposited by Municipality | 5,171.90 |
| Interest Earned | <u>1,123.78</u> |
| | \$ 23,291.32 |
| Less Expenditures | <u>-</u> |
| Balance at December 31, 1968 | \$ <u>23,291.32</u> |

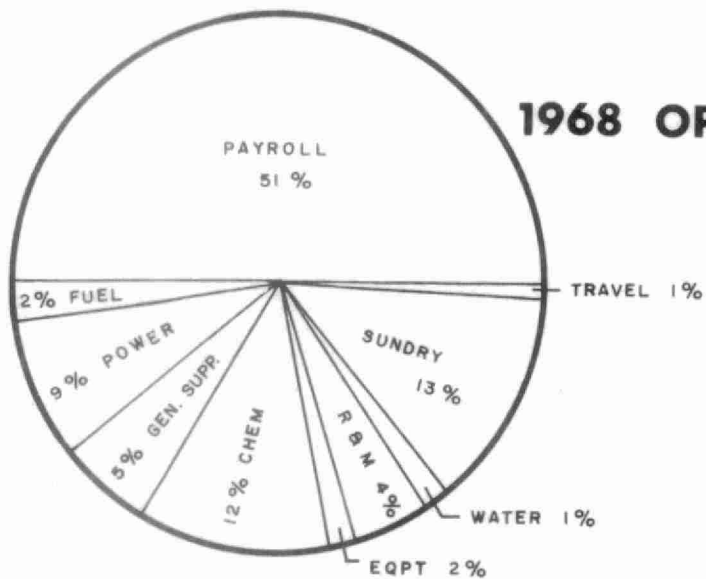
Monthly Operating Costs

| MONTH | TOTAL EXPENDITURE | PAYROLL | CASUAL PAYROLL | FUEL | POWER | CHEMICAL | GENERAL SUPPLIES | EQUIPMENT | REPAIRS & MAINTENANCE | * SUNDRY | WATER | TRAVEL |
|-------|-------------------|----------|----------------|--------|---------|----------|------------------|-----------|-----------------------|----------|--------|--------|
| JAN | 1451.21 | 982.80 | - | 96.87 | 202.87 | - | 66.40 | - | 87.67 | 6.50 | - | 8.10 |
| FEB | 2749.20 | 928.25 | - | 94.47 | 200.35 | 1109.85 | 64.17 | - | 24.46 | 320.25 | - | 8.40 |
| MAR | 2071.72 | 1456.90 | - | 115.93 | 182.25 | - | 173.09 | - | 64.96 | 59.99 | - | 18.60 |
| APRIL | 2268.00 | 928.25 | - | 71.77 | 209.31 | - | 201.18 | 140.00 | 69.61 | 638.88 | - | 9.00 |
| MAY | 1056.17 | 1039.50 | 18.00 | - | 180.44 | (900.00) | 83.98 | - | 182.08 | 272.73 | 172.24 | 7.20 |
| JUNE | 1697.19 | 942.26 | 37.76 | 33.65 | 189.20 | - | 112.57 | 163.81 | 10.58 | 198.13 | - | 9.15 |
| JULY | 3181.75 | 1010.57 | 90.79 | 27.21 | 180.08 | 1356.75 | 191.32 | - | 88.90 | 216.48 | - | 19.65 |
| AUG | 2166.96 | 1352.14 | 133.58 | - | 113.12 | - | 86.47 | 105.18 | 129.44 | 238.09 | - | 8.85 |
| SEPT | 2015.21 | 1123.53 | 33.00 | 93.82 | 76.96 | 304.50 | 159.48 | - | 170.44 | 15.80 | - | 37.68 |
| OCT | 2121.43 | 998.43 | 70.17 | 37.04 | 405.80 | 61.06 | 84.24 | - | 217.95 | 230.67 | - | 16.07 |
| NOV | 4004.68 | 1025.83 | - | 41.64 | 258.78 | 1026.90 | 185.56 | 99.39 | 273.65 | 870.77 | 141.56 | 80.60 |
| DEC | 3497.65 | 2041.41 | - | 80.57 | 247.72 | 304.50 | 146.44 | (10.20) | (89.23) | 692.83 | 64.56 | 19.05 |
| TOTAL | 28281.17 | 13829.87 | 383.30 | 692.97 | 2447.05 | 3263.56 | 1553.90 | 498.18 | 1230.51 | 3761.12 | 378.36 | 242.35 |

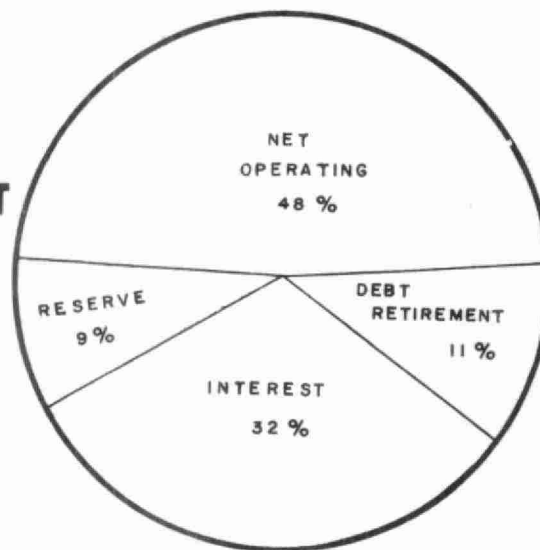
*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$2,446.50

BRACKETS INDICATE CREDIT

1968 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

| YEAR | M.G.TREATED | TOTAL COST | COST PER MILLION GALLONS | COST PER LB OF BOD REMOVED |
|------|-------------|-------------|--------------------------|----------------------------|
| 1966 | 367.78 | \$20,703.17 | \$56.29 | 7 cents |
| 1967 | 480.65 | 25,872.10 | 53.83 | 12 cents |
| 1968 | 497.54 | 28,281.17 | 56.84 | 17 cents |

Process Data

A total of 497,540,000 gallons was treated during the year with an average daily flow of 1.36 million gallons. This is a slight increase of 3.5 percent over the 1967 total flow. The average daily flow remained approximately the same as in 1967.

The probability of flow graph indicates that the dry weather design flow of 1.25 mgd was exceeded approximately 84 percent of the time in 1968.

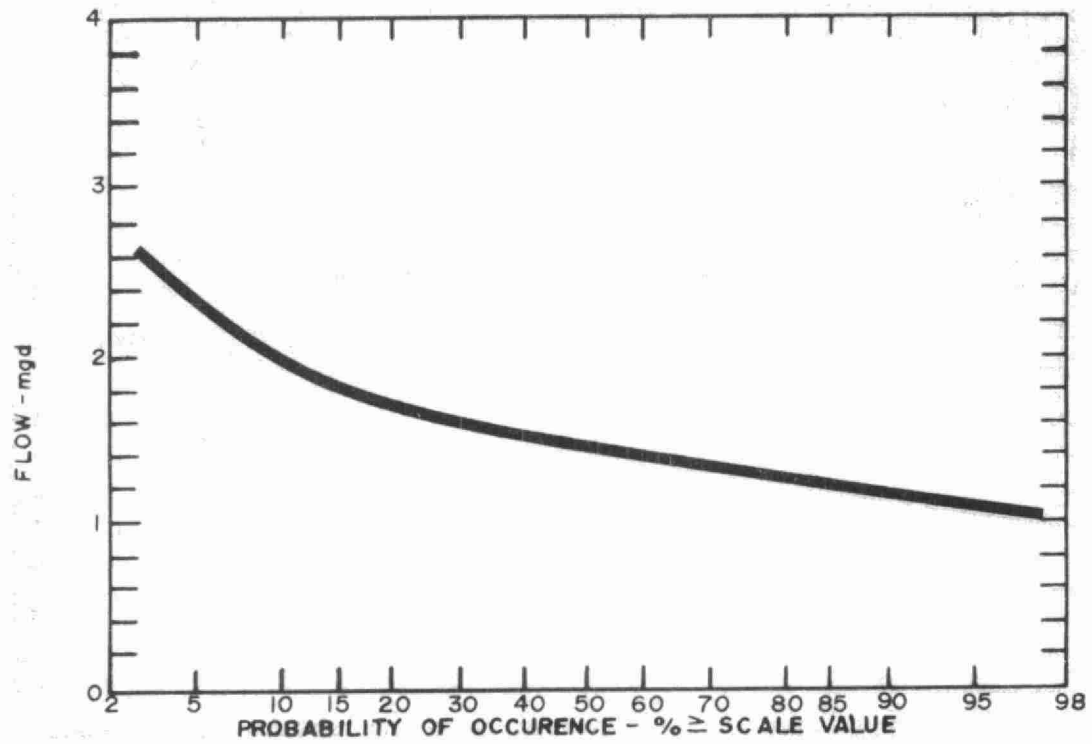
PLANT FLOWS and CHLORINATION

| MONTH | TOTAL FLOW mg | AVERAGE DAILY FLOW mg | MAXIMUM DAILY FLOW mg | MINIMUM DAILY FLOW mg | CHLORINE USED 10 ³ lbs. | DOSAGE mg/l |
|---------|------------------|-----------------------------|-----------------------------|-----------------------------|--|----------------|
| JAN | 38.13 | 1.23 | 1.37 | .90 | 1.94 | 5.1 |
| FEB | 37.41 | 1.29 | 2.95 | .97 | 1.89 | 5.1 |
| MAR | 50.26 | 1.62 | 2.44 | .84 | 2.22 | 4.4 |
| APR | 56.01 | 1.87 | 2.48 | .86 | 2.31 | 4.1 |
| MAY | 39.94 | 1.29 | 1.91 | .86 | 2.65 | 6.6 |
| JUN | 38.39 | 1.27 | 1.56 | .92 | 3.26 | 8.5 |
| JUL | 35.62 | 1.15 | 1.71 | .88 | 3.33 | 9.3 |
| AUG | 38.33 | 1.24 | 1.71 | .89 | 3.57 | 9.3 |
| SEPT | 39.28 | 1.31 | 1.98 | .85 | 3.45 | 8.8 |
| OCT | 39.77 | 1.28 | 1.47 | .86 | 3.54 | 8.9 |
| NOV | 40.57 | 1.35 | 2.18 | .97 | 3.46 | 8.5 |
| DEC | 43.83 | 1.41 | 2.85 | 1.06 | 3.04 | 6.9 |
| TOTAL | 497.54 | - | - | - | 34.66 | - |
| AVERAGE | - | 1.36 | - | - | 2.89 | 5.8 |

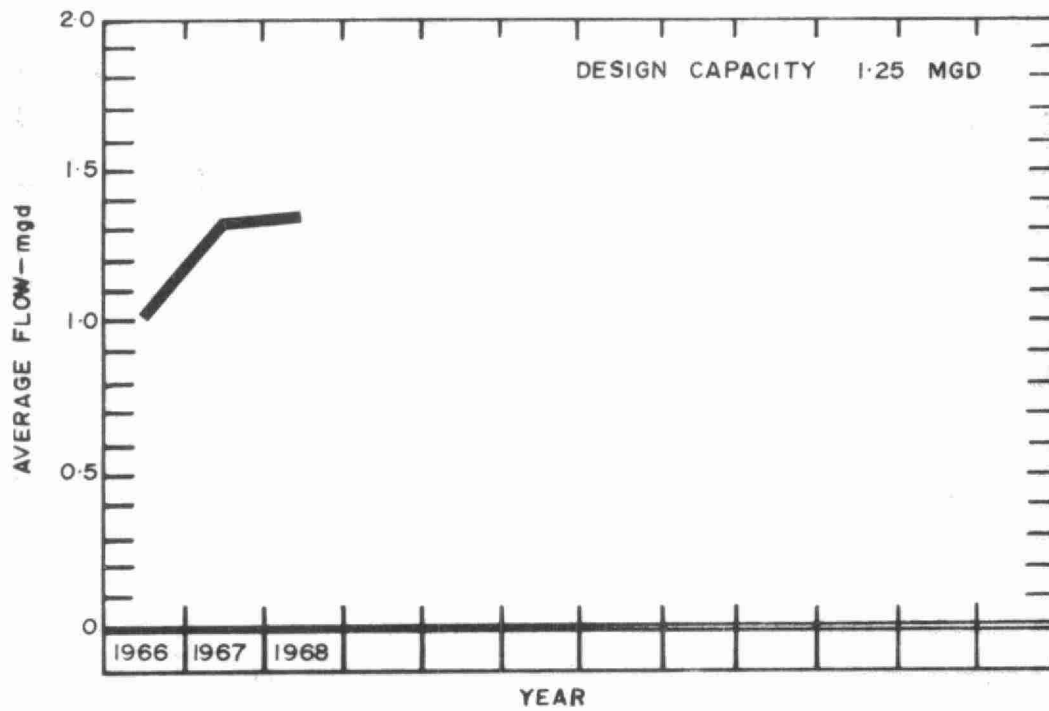
COMMENTS

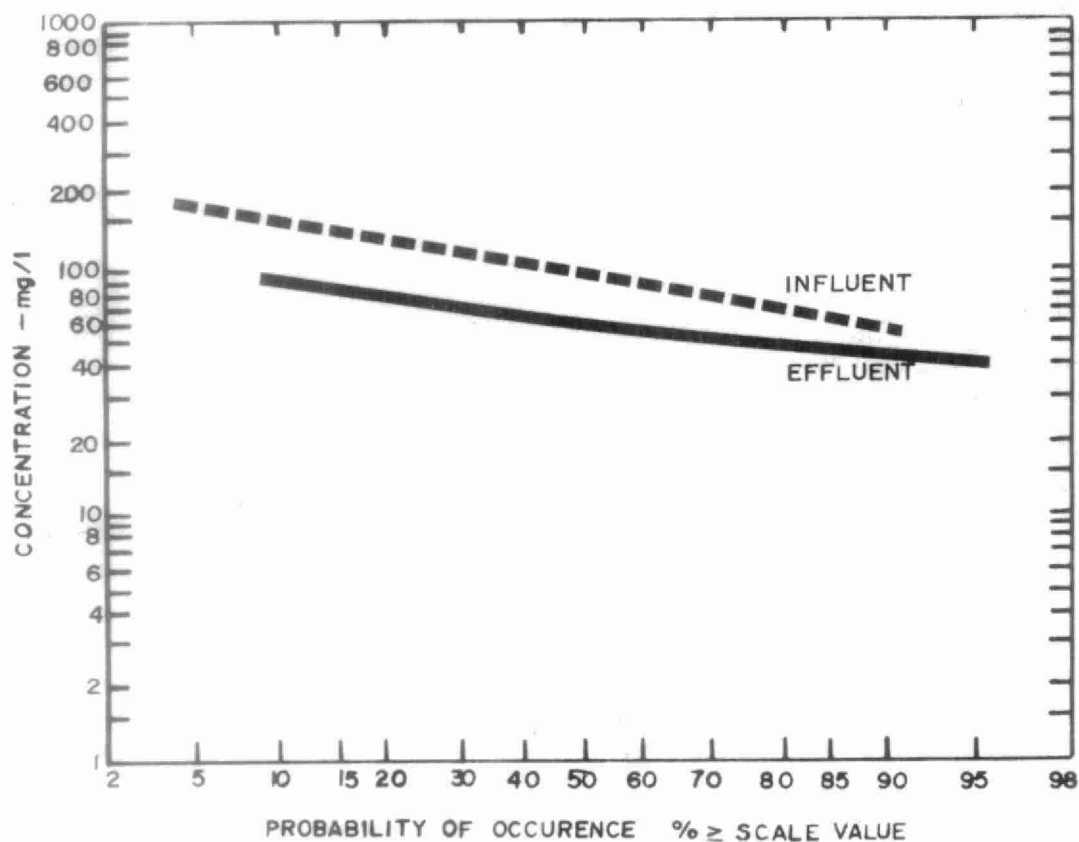
The total flow to the plant in 1968 was 497.54 million gallons. The average daily flow was 1.36 mgd, and the maximum and minimum daily flows were 2.95 million gallons and 0.84 million gallons respectively. The probability of the flow graph indicates that the plant was hydraulically overloaded 84 percent of the time.

An average dosage rate of 5.8 mg/l was used throughout the year to maintain a chlorine residual of 0.5 mg/l. This required 34,660 pounds of chlorine, or about 70 pounds of chlorine per million gallons of sewage treated.

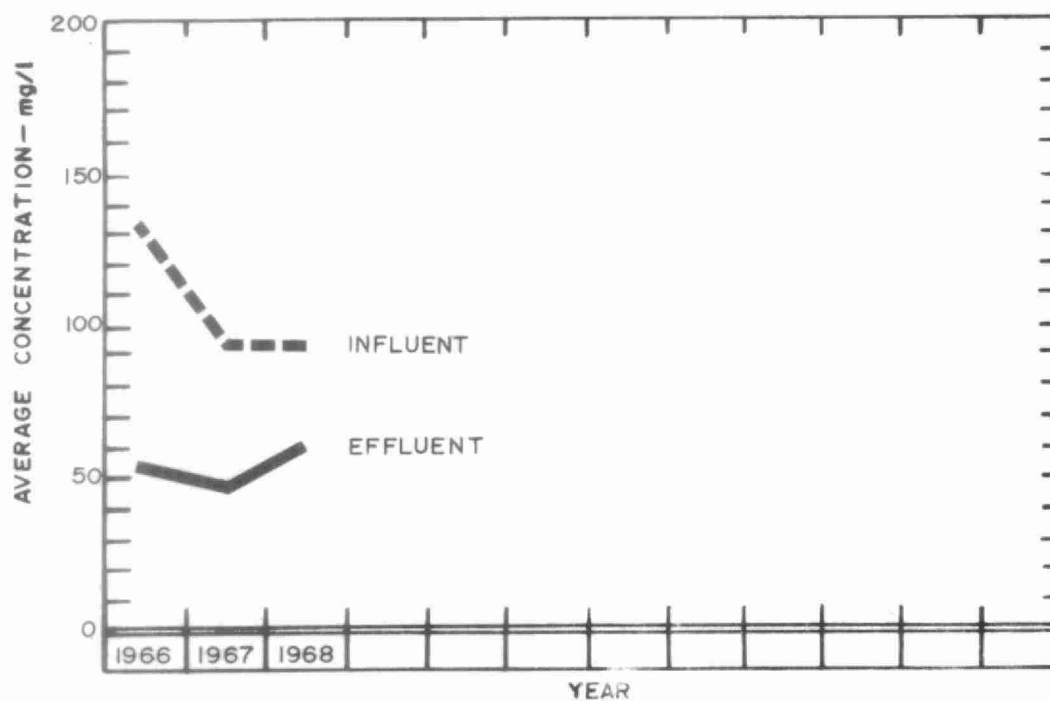


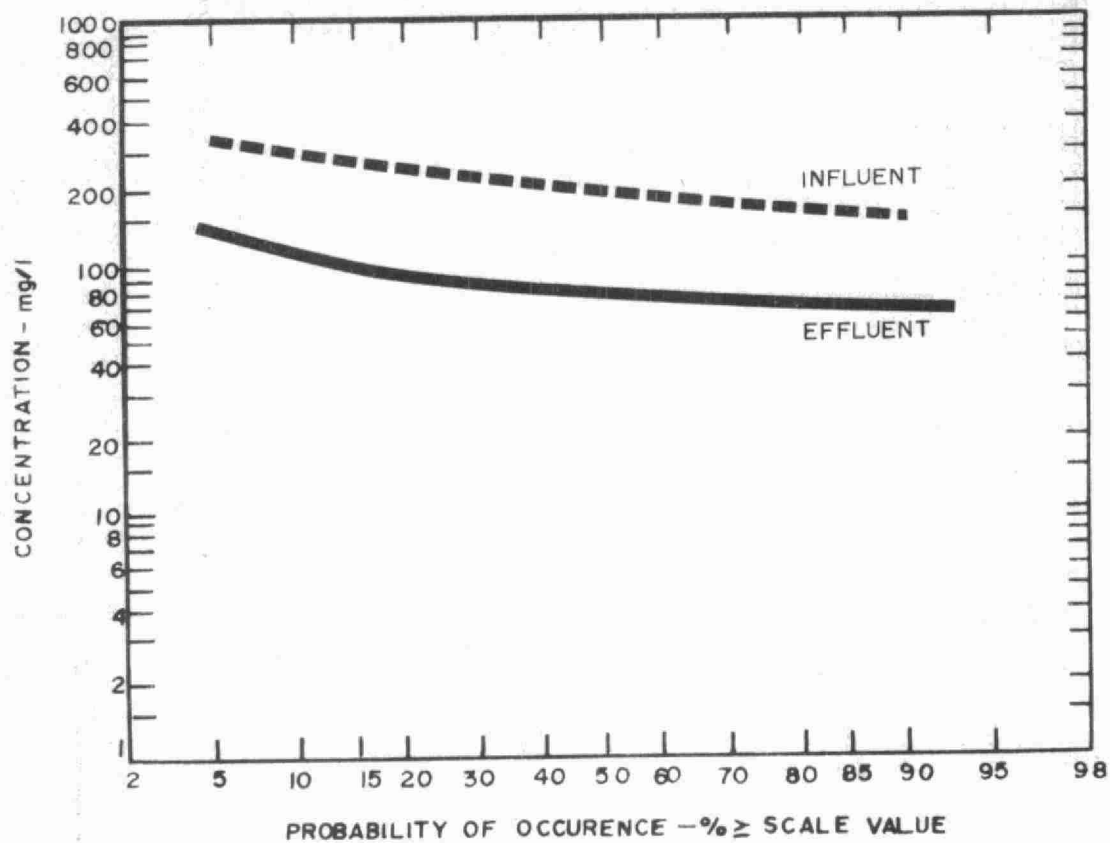
FL O W S



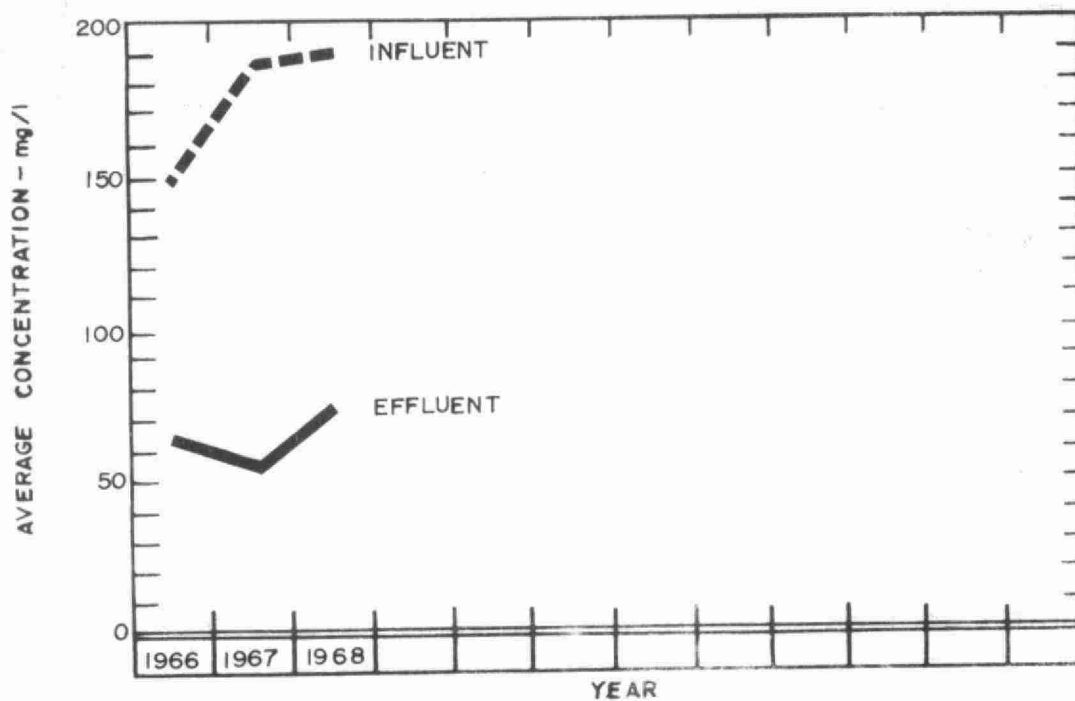


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



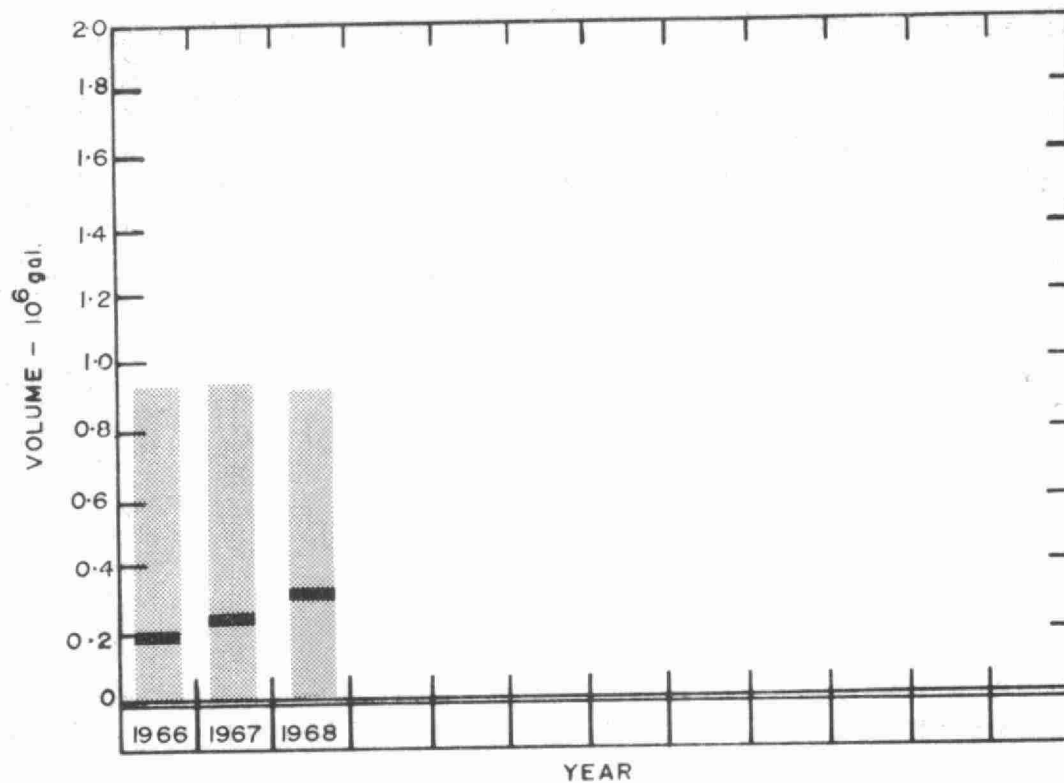
PLANT EFFICIENCY

| MONTH | BIOCHEMICAL OXYGEN DEMAND | | | | SUSPENDED SOLIDS | | | | GRIT |
|---------|----------------------------------|----------------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------|----------------------------------|----------------------------|
| | INF CONC ^N mg/l | EFF CONC ^N mg/l | RED ^N % | REMOVAL 10 ³ lb | INF CONC ^N mg/l | EFF CONC ^N mg/l | RED ^N % | REMOVAL 10 ³ lb | REMOVAL ft ³ |
| JAN | 144 | 84 | 42 | 22.9 | 174 | 62 | 64 | 42.7 | 32 |
| FEB | 81 | 61 | 25 | 7.5 | 137 | 65 | 53 | 26.9 | 90 |
| MAR | 135 | 85 | 37 | 25.1 | 182 | 92 | 49 | 45.2 | 70 |
| APR | 130 | 70 | 46 | 33.6 | 181 | 86 | 52 | 53.2 | 175 |
| MAY | 65 | 42 | 20 | 5.2 | 194 | 65 | 66 | 51.5 | 120 |
| JUN | 100 | 52 | 48 | 18.4 | 260 | 99 | 62 | 61.8 | 100 |
| JULY | 93 | 57 | 39 | 12.7 | 242 | 85 | 65 | 55.9 | 102 |
| AUG | 60 | 27 | 55 | 12.6 | 151 | 80 | 47 | 27.3 | 220 |
| SEPT | 55 | - | - | - | - | - | - | - | 183 |
| OCT | 91 | 55 | 40 | 14.3 | 131 | 61 | 53 | 27.8 | 65 |
| NOV | 115 | 64 | 44 | 20.7 | 313 | 56 | 82 | 104.3 | 55 |
| DEC | 65 | 60 | 8 | 2.2 | 130 | 50 | 62 | 35.1 | 82 |
| TOTAL | - | - | - | - | - | - | - | - | 1294 |
| AVERAGE | 95 | 61 | 36 | 15.9 | 189 | 73 | 61 | 48.3 | 108 |

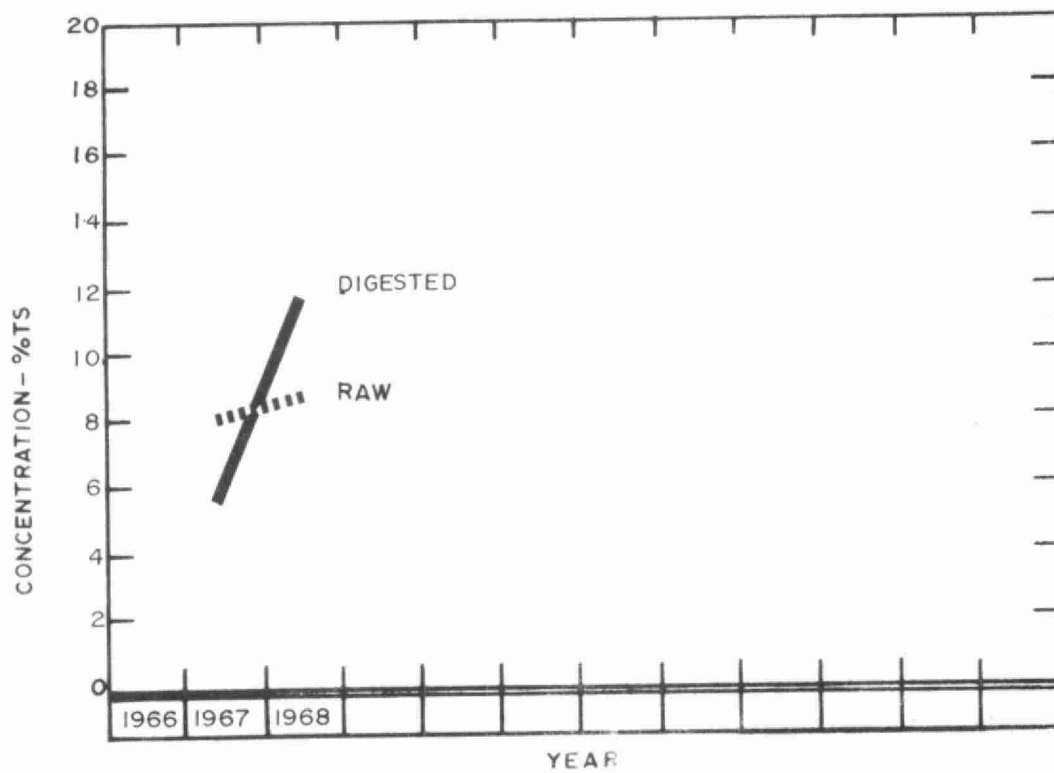
COMMENTS

The average influent BOD and suspended solids was 95 mg/l and 189 mg/l respectively. These figures represent a reduction of 36% BOD and 61% suspended solids. These results are normal for a primary plant treating raw sewage.

A total of 1294 cubic feet of grit was removed, for an average of 2.6 cubic feet of grit per million gallons treated.



DIGESTION



SLUDGE DIGESTION and DISPOSAL

| MONTH | RAW SLUDGE | | | DIGESTED SLUDGE | | | SUPERNATANT | | SLUDGE DISPOSAL | |
|---------|----------------------------------|------------|------------|----------------------------------|------------|------------|----------------------------------|------------|---------------------------|------------------------------|
| | VOLUME 10 ³ gal | T. S. % | V. S. % | VOLUME 10 ³ gal | T. S. % | V. S. % | VOLUME 10 ³ gal | T. S. % | LIQUID yd ³ | DEWATERED yd ³ |
| JAN | 70.8 | 4.6 | 64 | 26.3 | 16.3 | - | - | .39 | 0 | 156 |
| FEB | 74.0 | 5.0 | 43 | 31.3 | 12.5 | 36 | - | - | 0 | 186 |
| MAR | 93.6 | 11.1 | 37 | 30.3 | 17.1 | - | - | .30 | 0 | 180 |
| APR | 92.2 | 7.3 | 49 | 35.4 | - | - | - | - | 0 | 210 |
| MAY | 75.8 | - | - | 25.3 | - | - | - | .22 | 0 | 150 |
| JUN | 73.5 | - | - | 19.1 | 3.6 | - | 47.7 | .24 | 0 | 113 |
| JUL | 79.2 | - | - | 30.0 | - | - | 50.0 | - | 0 | 176 |
| AUG | 76.4 | 11.3 | 40 | 27.0 | 11.8 | 30 | 40.8 | - | 0 | 162 |
| SEPT | 75.5 | - | - | 27.0 | - | - | 50.4 | - | 0 | 161 |
| OCT | 72.3 | 12.3 | 80 | 29.0 | 10.0 | 34 | 44.7 | - | 0 | 173 |
| NOV | 72.4 | - | - | 26.0 | - | - | 46.7 | - | 0 | 150 |
| DEC | 76.9 | - | - | 30.0 | - | - | 46.9 | - | 0 | 180 |
| TOTAL | 932.6 | - | - | 336.7 | - | - | - | - | 0 | 2003 |
| AVERAGE | 77.7 | 8.6 | 52 | 28.1 | 11.9 | 33 | 46.7 | .28 | 0 | 167 |

COMMENTS

The total amount of sludge pumped to the digesters was 932,600 gallons. Dewatered sludge was hauled regularly throughout the year and a total of 337,465 gallons were removed.

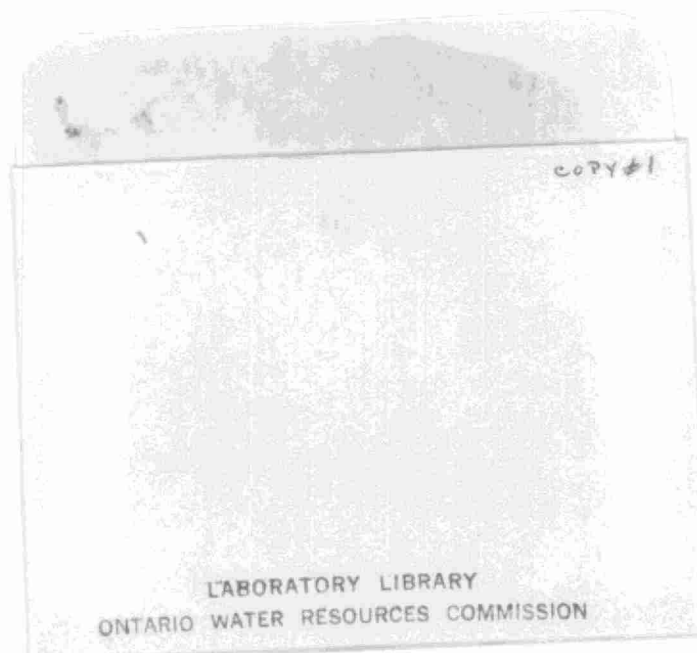
The digested sludge concentration increased by 3.3% over the raw sludge concentration.



CONCLUSIONS

The plant is hydraulically overloaded 84 percent of the time. The storm water separation programme should be encouraged. There has been a 14 percent increase in hydraulic overloading over 1967.

Industries dumping waste into our sewers have developed their own pre-treatment facilities to help alleviate the plant's process problems. However, excesses of some industrial wastes still caused process problems at the plant.





Water management in Ontario